

## **REMARKS**

Please reconsider the present application in view of the above amendments and the following remarks. Applicant thanks the Examiner for carefully considering the present application.

### **I. Disposition of Claims**

Claims 1-22 are pending in the present application. Claims 1, 6, 11, and 17 have been amended. New claims 23-25 have been added.

### **II. Claim Amendments**

Independent claims 1, 6, 11 and 17 have been amended to recite that the first bump is adjacent to the second bump. No new matter has been added by way of these amendments as support for these amendments may be found, for example, in Figure 8a of the present application.

### **III. Rejection(s) Under 35 U.S.C § 102**

Claims 1-22 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,323,559 issued to Chan et al. (hereinafter "Chan"). To the extent that this rejection still applies to amended independent claims 1, 6, 11, and 17 of the present application, this rejection is respectfully traversed for the reasons set forth below.

The present invention is directed to an improved integrated circuit power grid bump placement layout. As shown in the exemplary embodiment of Figure 8a of the present application, in the bump placement layout of the present invention as recited in

amended independent claims 1, 6, 11, and 17 of the present application, bumps are positioned such that an angle between a line from a reference bump **56c** on a first metal bar **54** to a first bump **56a** on a second metal bar **52** and a line from the reference bump **56c** to a second bump **56b** on the second metal bar **52** is substantially equal to 150 degrees. Further, as required by amended independent claims 1, 6, 11, and 17 of the present application, the first bump **56a** is adjacent to the second bump **56b**.

Because the first bump **56a** is adjacent to the second bump **56b**, in order to facilitate the substantially equal to 150 degrees angle described above, the metal bars **52**, **54** must be brought in closer together as shown, for example, in Figures 8a and 8b of the present application. On the other hand, if the metal bars **52**, **54** are distanced from each other, i.e., moved away from each other, the angle between the line from the reference bump **56c** to the first bump **56a** and the line from the reference bump **56c** to the second bump **56b** (which is adjacent to the first bump **56a**) must necessarily decrease.

Chan discloses a bump arrangement that fails, either explicitly or inherently, to disclose the bump arrangement as recited in amended independent claims 1, 6, 11, and 17 of the present application. For example, with reference to Figure 10 of Chan, if one were to measure an angle between a line from a bump in row **282** to any bump in row **280** and a line from the bump in row **282** to any other bump in row **280** (where the “any other” bump is adjacent to the “any” bump), the angle would be around 60 degrees, roughly 90 degrees away from the substantially equal to 150 degrees angle claimed in amended claims 1, 6, 11, and 17 of the present application. In order for Chan to disclose the substantially equal to 150 degrees angle, the rows **280**, **282** in Figure 10 of Chan would have to be interlocked as shown in Figures 8a-8c of the present application. Chan clearly

makes no showing, or other teaching, of such positioning of the rows.

The final Office Action cites of January 24, 2003 indicates that the substantially equal to 150 degrees angle claimed in amended independent claims 1, 6, 7, and 11 of the present application is disclosed by Chan's reference to a group of bump pads formed in parallelograms in column 7, lines 15 – 29. *See* final Office Action of January 24, 2003, page 3. Applicant initially notes that this group of pads is in row **281** in Figure 10 of Chan, not in the rows **280, 282** in Figure 10 of Chan used to describe the placement of bumps in Chan with reference to the present invention. The Examiner cannot pick and choose bumps in Figure 10 of Chan to achieve the resulting features of the claimed invention without meeting the limitations and constraints recited in amended independent claims 1, 6, 11, and 17 of the present application.

Moreover, the grouping of bump pads in row **281** in Figure 10 of Chan in parallelograms in no way discloses, or teaches, that bumps are or can be arranged according to the substantially equal to 150 degrees angle requirement of amended independent claims 1, 6, 11, and 17 of the present application. As shown in Figure 9 of Chan, this parallelogram group, whether viewed as having rows horizontally or vertically) results in angles of about 60 degrees between a line from a bump in a first row to a first bump in a second row and a line from the bump in the first row to a second bump (adjacent to the first bump in the second row) in the second row.

In view of the above, Chan fails to show or suggest the present invention as recited in amended independent claims 1, 6, 11, and 17 of the present application. Thus, amended independent claims 1, 6, 11, and 17 of the present application are patentable over Chan. Dependent claims are allowable for at least the same reasons. Accordingly,

withdrawal of this rejection is respectfully requested.

#### **IV. New Claims**

New claims 23-25 have been added. New dependent claim 23 (dependent from amended claim 1) recites that the first and second metal bars are interlocked. No new matter has been added by way of new dependent claim 23 as support for new claim 23 may be found, for example, in Figures 8a-8c, and the corresponding descriptions thereof, of the present application.

New dependent claim 24 (dependent from amended claim 1) recites that there is a finite amount of spacing between the first and second metal bars. No new matter has been added by way of new dependent claim 24 as support for new dependent claim 24 may be found, for example, in Figures 8a-8c, and the corresponding descriptions thereof, of the present application.

New dependent claim 25 (dependent from amended claim 1) recites that the first bump, the second bump, and the reference bump are partially aligned. No new matter has been added by way of new dependent claim 25 as support for new dependent claim 25 may be found, for example, in Figures 8a-8c, and the corresponding descriptions thereof, of the present application.

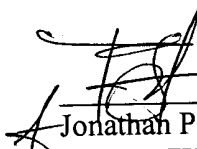
Accordingly, entry and favorable treatment of new claims 23-25 is respectfully requested.

**V. Conclusion**

Applicant believes this reply to be fully responsive to all outstanding issues and place this application in condition for allowance. If this belief is incorrect, or other issues arise, do not hesitate to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 03226.147001;P6841).

Date: 7/24/03

Respectfully submitted,

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